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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/050,293	01/18/2002	Charles Douglas Murphy		7021

30320 7590 01/13/2005  
CHARLES DOUGLAS MURPHY  
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EVANSTON, IL 60202

EXAMINER

DO, CHAT C

ART UNIT PAPER NUMBER

2124

DATE MAILED: 01/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/050,293

Applicant(s)

MURPHY, CHARLES DOUGLAS

Examiner

Chat C. Do

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, all the limitations cited in claims 1-10 must be clearly shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Specification***

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

3. The abstract of the disclosure is objected to because the abstract exceeds 150 words in length. Correction is required. See MPEP § 608.01(b).

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 1, the terms "can", "can be", "cannot", and "may be" throughout are relative terms which renders the claim indefinite. The terms "can", "can be", "cannot", and "may be" are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Claims 2-20 have the same rejection.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 5, 11, and 15 are rejected under 35 U.S.C. 103(a) as being obvious over Deutsch et al. (U.S. 4,031,377) in view of Richardson (U.S. 5,262,973).

Re claim 1, Deutsch et al. disclose in Figure 1 a machine used in computing one or more sums of products (e.g. product computes by shifting in 12 and 13 and summing is done by accumulator 83) comprising: a. as a first multiplier input (e.g. S from 81), a first real number which can be a member of a first set of representations in a first finite-precision numeric format for a first set of number values (e.g. equation 3 in col. 1 line 51) and which can be a member of a second set of representations in a second finite-precision numeric format for a second set of number values (e.g. col. 1 lines 49-50) b. as a second multiplier input (e.g. C from 82), a second real number which can be a member of a third set of representations in a third finite-precision numeric format for a third set of number values (e.g. equation 7 in col. 2 line 43) and which can be a member of a fourth set of representations in a fourth finite-precision numeric format for a fourth set of number values (e.g. table II with decimal value of the mantissa in binary), where: i. third set of representations in third finite-precision numeric format has at least one member (e.g. a0, a1, a2 in equation 7 in col. 2 line 43 and parameters input into 14 of Figure 1) ii. third set of number values has at least one member (e.g. a0, a1, a2 in equation 7 in col. 2 line 43

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and parameters input into 14 of Figure 1) iii. fourth set of representations in fourth finite-precision numeric format has at least one member (e.g. Table II in col. 2 with 8 and 9 as members) iv. fourth set of number values has at least one member third finite-precision numeric format is not the same as fourth finite-precision numeric format (approximation)

c. combined multiplier means (Figure 1 by shifting 12-13 and adding/accumulating 83) for computing a first product equal to the product of first multiplier input and second multiplier input (output of 27 is  $X = SC$ ) where: i. combined multiplier means (Figure 1) includes first multiplier means (e.g. 12-13 and 27) for computing first product when second real number has a representation from third set of representations in third finite-precision numeric format and a corresponding number value from third set of number values whereby combined multiplier means (Figure 1 with 12-13 as shifter for multiple multiplication and 27 as adder for adding/accumulation) can accommodate a number to be multiplied that may be represented in different finite-precision numeric formats, and whereby first multiplier means and hence combined multiplier means can be implemented with lower cost (e.g. cost in term of speed as cited in col. 2 lines 31-34) than if first multiplier means must be able to accommodate all allowed representations and number values of second multiplier input. Deutsch et al. do not disclose a combined multiplier means includes second multiplier means for computing first product when second real number has a representation from fourth set of representations in fourth finite-precision numeric format and a corresponding number value from fourth set of number values and combined multiplier means cannot compute first product using first multiplier means when second real number does not have both a representation from third

set of representations in third finite-precision numeric format and a corresponding number value from third set of number values. However, Richardson discloses in Figure 4a multiple multiplication means for different input formats a combined multiplier means (Figure 4a) includes second multiplier means (e.g.  $Z = X * Y$  box) for computing first product when second real number has a representation from fourth set of representations in fourth finite-precision numeric format and a corresponding number value from fourth set of number values and combined multiplier means (e.g. in case the multiplicand is a N/A or not a number) cannot compute first product using first multiplier means when second real number does not have both a representation from third set of representations in third finite-precision numeric format and a corresponding number value from third set of number values. Therefore, it would have been obvious to a person having ordinary skill in the art at the time is made to add a second conventional multiplier as seen in Richardson's invention for multiplying two inputs given certain format and cannot compute a product if a second number does not have both representation into Deutsch et al.'s invention because it would enable to provide the correct product of two input in the system.

Re claim 5, Deutsch et al. further disclose in Figure 1 a. first set of representations in first finite-precision numeric format includes all possible representations in first finite-precision numeric format (Table 1 wherein each of digit can either be 0 or 1 in col. 2 lines 50-57 for so-sq in equation 3) b. first set of number values includes all possible number values (Table 2 as sample for so-sq in equation 3) supported by first finite-

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precision numeric format whereby combined multiplier means can accept as first multiplier input any number represented in first finite-precision numeric format.

Re claim 11, it is a method claim of claim 1. Thus, claim 11 is also rejected under the same rationale as cited in the rejection of rejected claim 1.

Re claim 15, it is a method claim of claim 5. Thus, claim 15 is also rejected under the same rationale as cited in the rejection of rejected claim 5.

### ***Allowable Subject Matter***

8. Claims 2-4, 6-10, 12-14, and 16-20 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. U.S. Patent No. 6,223,197 to Kosugi discloses a constant multiplier, method and device for automatically providing constant multiplier and storage medium storing constant multiplier automatic providing program.

b. U.S. Patent No. 5,732,004 to Brown discloses a DSP architecture for a FIR-type filter and method.

c. U.S. Patent No. 4,967,388 to Tate discloses a truncated product partial canonical signed digit multiplier.



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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chat C. Do whose telephone number is (571) 272-3721. The examiner can normally be reached on M => F from 7:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chaki Kakali can be reached on (571) 272-3719. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chat C. Do  
Examiner  
Art Unit 2124

January 6, 2005

A handwritten signature in black ink, appearing to read 'TODD INGBERG', written over a horizontal line.

**TODD INGBERG**  
**PRIMARY EXAMINER**